Zenit - E

SERVICE PROCEDURE

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The Body -dismantling

Removal of lens

Remove lens from the body by screwing anti-clockwise.

Removal of base plate

Unscrew the four countersunk screws (5) and lift off the flat base plate (4).

Removal of top plate

(i) Raise the rewind knob (70) into the rewind position by turning quarter turn anti-clockwise. Remove the rewind knob by unscrewing anti-clockwise. Leave the shaft (67) in position.

FIG. 1

(ii) Remove the speed dial (98) by removing the two grub screws (99). Remove the flash indicator dial (102) by removing the grub screw (101). *Note the position* of the speed dial setting, and the 'X-M' setting *before* removing these parts.

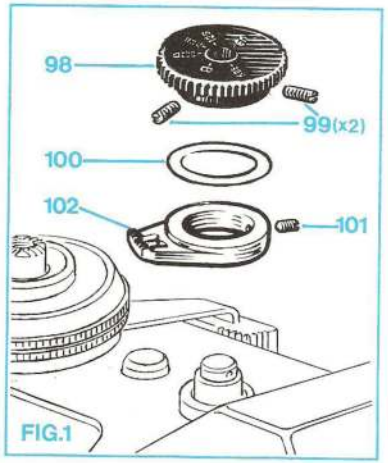


FIG.1

FIG. 2

(iii) Remove meter follow pointer dials by removing securing nut (96) with a pair of long nose pliers.

FIG. 3

(iv) Remove counter and leverwind assembly by removing the locking nuts (103) and (107), and counter bearing (106). *These three parts are all left hand threaded.*

(v) Remove the leverwind (110) and securing ring (109) by removing the three countersunk screws (108). When the leverwind is removed the ratchet assembly (112) which is situated under the top plate, should turn under spring pressure, releasing the tension on the leverwind spring.

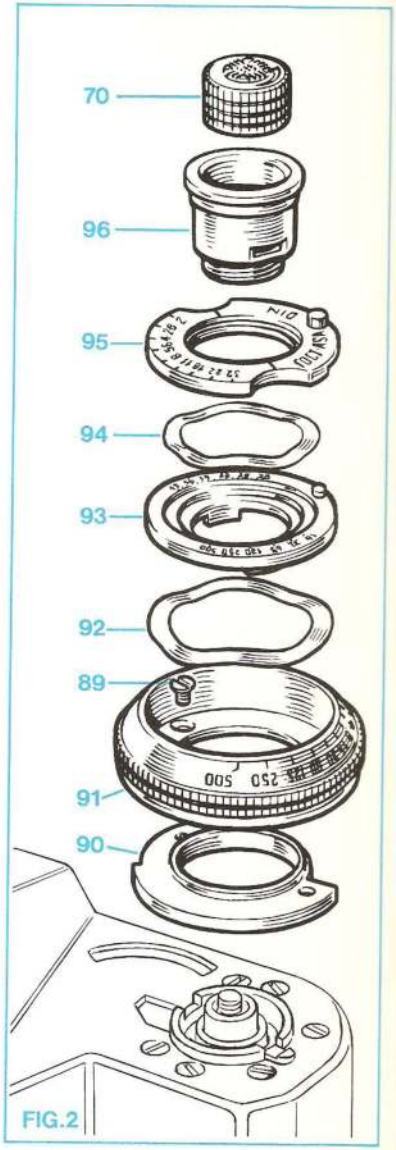


FIG.2

FIG. 4

(vi) There are seven screws visible on the top plate. It is important to note that *only three* of these are *to be removed* in order to remove the top plate. **(The other screws retain the meter unit, and should not be removed at this stage).**

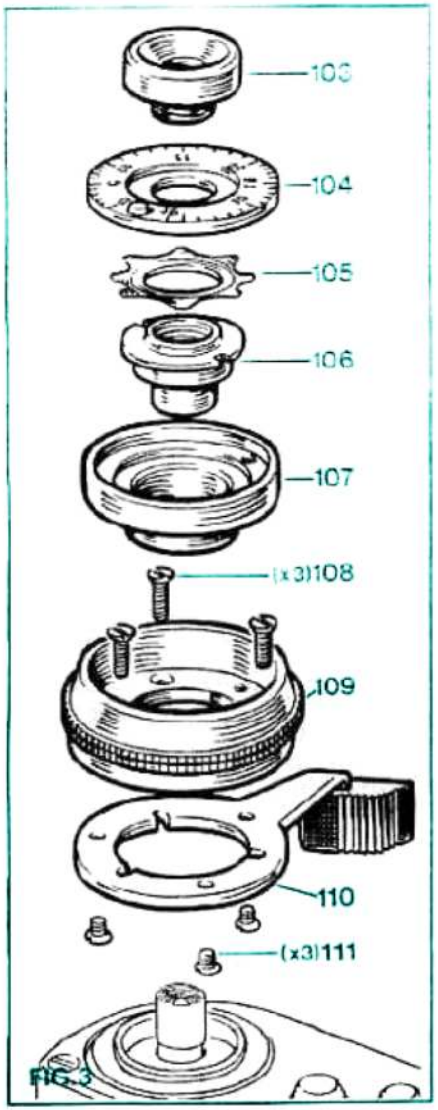


FIG.3

FIG. 4

Remove the single chrome countersunk screw at the top right hand corner of the top plate. On the left hand side of the top plate are a group of six screws. The upper and lower screws in this group (at the 6 O'clock and 12 O'clock positions) are the only ones to be removed.

FIG. 5

(vii) Lift off the top plate. This rewind button and shaft (44) will be loose and should be removed. The leverwind spring (97) should be loosely wound round the ratchet assembly (112). These two parts may be removed by lifting the ratchet assembly clear. For convenience when later setting up the camera it is often advisable to replace the ratchet assembly, minus the leverwind spring at this point. This enables the camera to be 'wound on' by turning the ratchet by hand.

Note: It may not be necessary to dismantle the camera any further than this to effect many repairs or adjustments. See notes on 'Blind tensioning and adjustments' and 'Common faults and their rectifications'.

Mirror box removal

FIG. 6

(i) Remove the cover plate (12) by removing the two screws (13). Access is through the lens mount.

(ii) Remove the three mirror box retaining screws (26) and lift the mirror box (28) clear.

Mirror lifting mechanism removal

Remove the mirror lifting mechanism assembly (11), by removing the three securing screws (10), Spring tension on the cam will be lost as this part is removed.

Shutter blind removal

FIG. 7

(i) Remove the flas contact assembly (29) by removing the two screws (27). These two screws are readily identified as they are not connected to either metal contact strip on the flash contact assembly.

(ii) If required, put the shutter mechanism in the 'cocked' or 'ready to fire' position, by winding the ratchet assembly (112). If this part has been removed from the camera, it may be conviently replaced, temporarily at this point. The attached spring is not required for these temporary operations, and should be removed.

(iii) Remove the speed selector shaft (39) by unscrewing the retaining nut (42). There is a hole in the side of the retaining nut which allows the insertion of a small screw-driver blade to assist with removal.

FIG. 14

(iv) Remove the speed cam (38) by removing the grub screw (37) and lifting the cam clear of the shaft. This may require pressure, as the cam may be tight on the shaft.

(v) Remove the screw (34) and spring (33). Remove the second blind retaining lever (45) by lifting it upwards.

FIG. 9

(vi) Remove the second blind retaining cam assembly (43) by means of the three screws (35).

FIG. 8

(vii) Remove the tripod bash (62) by removing the four fixing screws (63).

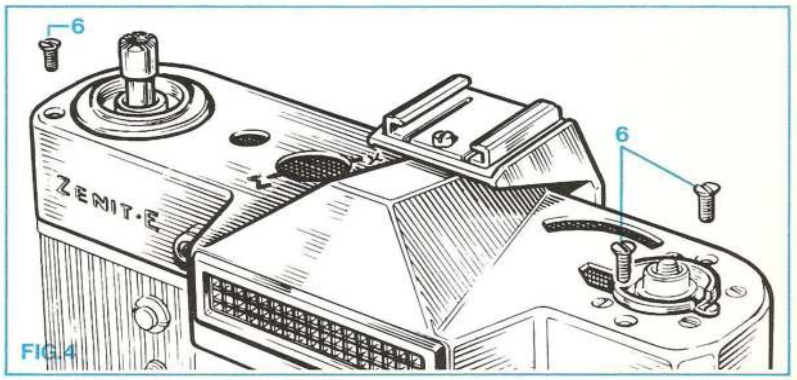


FIG.4

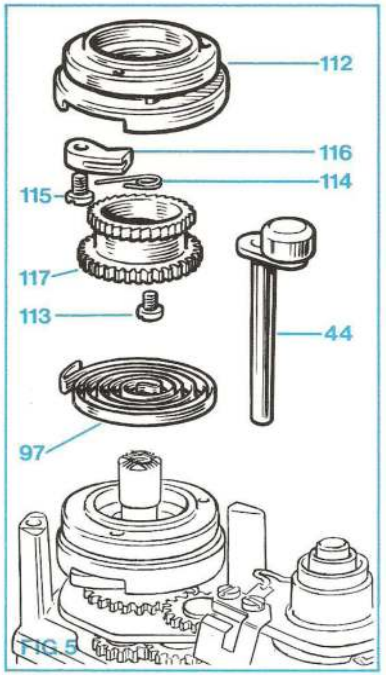


FIG.5

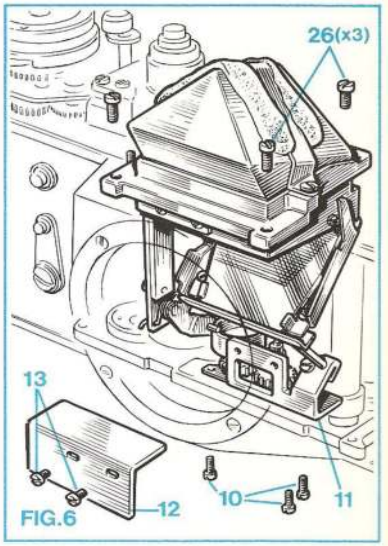


FIG.6

FIG. 8

(viii) Remove the shutter release spring plate (64) by removing the two screws (52). The base of the shutter release shaft (59) is fitted into a keyhole on this plate. The spring plate must be moved sideways before being lifted clear to disengage the keyhole slot. Removal of the screws retaining this spring plate will free the blind guide cover (55) and retaining plate (54). The main shutter release shaft (60) may also be removed.

(ix) Remove the blind roller covers (56 & 58) by removing the two screws (57) situated at the top of the camera body.

(x) Remove the blind bearing plate (149) by removing the four retaining screws–three raised head screws (53) and one countersunk screw (63). The blind bearing plate and shutter blind assembly may then be withdrawn as one unit from the body.

FIG. 9

Renewing shutter blinds (See also p20 for factory recommended modifications)

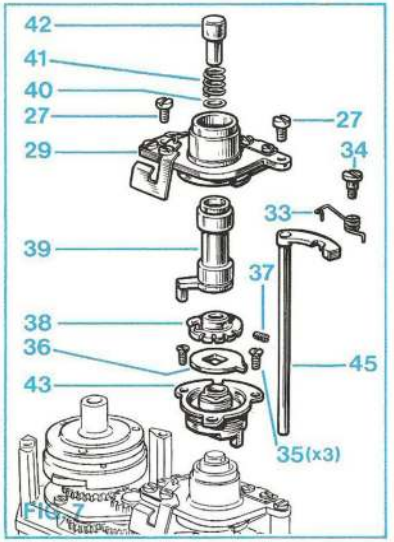


FIG.7

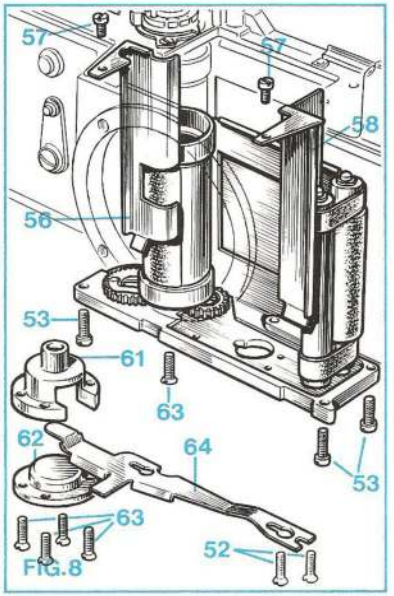


FIG.8

(i) Remove the tension from the affected blind by releasing the blind roller lock nut (140) situated on the blind bearing plate (149).

(ii) Remove the end of the blind (or blind tape, as appropriate) from the blind drum, noting the position of the end of the blind on the drum. Remove the other end of the blind from the blind roller.

(iii) The new blind may now be fitted, ensuring that it is located correctly in relation to the other blind, and the blind rollers. (see fig 9.)

(iv) Glue the appropriate end of the blind into place on the drum, ensuring that no glue is allowed to contaminate any other parts of the blind. Glue the other end into place on the roller.

(v) Lightly tension the blind, firstly winding it fully onto the appropriate blind roller, and replace the blind unit temporarily into the camera body. Check the positioning of the blinds. Check that the operational edges of both blinds are vertical when travelling across the film plane.

(vi) If the blinds are positioned correctly, the blinds may now be tensioned. (See 'Blind tensioning and adjustment').

FIG. 9, 10, 11 & 12

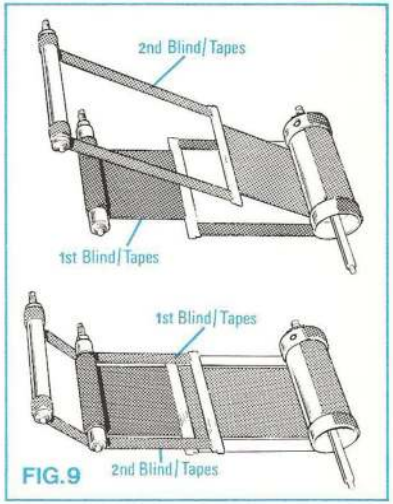


FIG.9

Note the relationship of the blinds and tapes, and the blind rollers. In particular, note that the first blind and roller are in effect threaded *through* the tapes of the second blind. Therefore when fitting the second blind tapes they must be threaded in front of the first blind roller.

The Body -reassembly

Reassembly Procedure

In general, the reassembly procedure is the reverse of the dismantling procedure. However there are certain specific points which must be watched, in particular, care should be taken over the correct positioning of the shutter blinds and roller assembly.

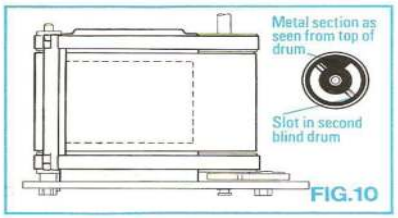
(i) With the mechanism in the 'fired' position, replace the shutter blinds and blind bearing plate.

(ii) Replace the second blind retaining cam (43). The lug on this cam should line up exactly with the hole for the shaft of the retaining lever (45). If the lug does not line up with this hole, the blinds are incorrectly positioned.

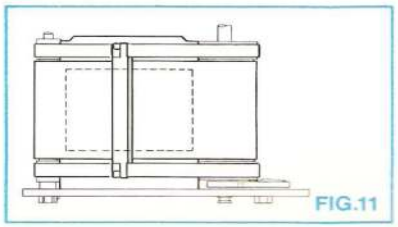
(iii) Wind on to the 'ready to fire' position, by turning the ratchet assembly (112) by hand. To engage the gears you will need to insert the shutter release shaft (59) and press it upwards to engage the gears as you are turning the ratchet assembly.

(iv) Ensure that both blinds are moving as the mechanism is wound on. The blinds should come to rest in the position shown in figure 12.

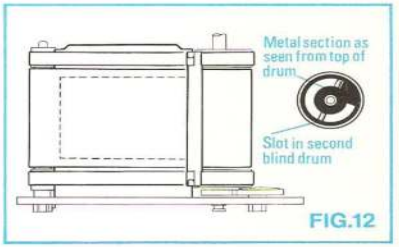
FIG. 9, 10, 11 & 12



The shutter is in the fired position. The leading edge of the second blind totally covers the left hand edge of the film frame. The slot in the 2nd blind drum is aligned as shown with the metal section of the first blind tape drum.



Shutter blinds being wound on. Note that amount of blinds metal edge overlap decreases whilst being wound on.



With the shutter in the 'ready to fire' position the leading edge of the first blind is against the right hand edge of the film frame. The metal edge of the second blind is situated exactly above the metal edge of the first blind. There is therefore an overlap the width of the metal blind edge.

(v) Replace the spring plate (64), first ensuring that the delayed action pin (48) is inserted into the hole in the blind bearing plate, and that the shutter release shaft (59) is in place. The spring plate must be moved to one side slightly to enable the base of the shutter release shaft to engage the keyhole slot.

(vi) Replace the retaining plate (54) by screwing through the spring plate, blind bearing plate, and the blind guide cover (55).

(vii) Replace the second blind retaining lever (45), ensuring that it is pressed fully home until spring pressure is felt from the spring plate in the base of the camera.

(viii) Replace spring (33) and securing screw (34). The spring should then press the end of the second blind retaining lever (45) against the chrome raised post.

(ix) At this point, check the operation of the shutter by winding on and pressing the release. It should work as if on 'B'.

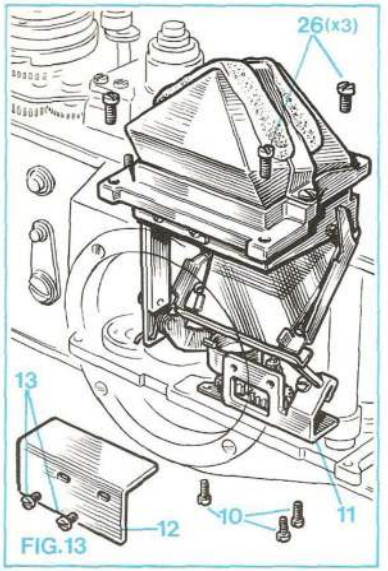
(x) Replace blind roller covers (56 & 58) by means of screws (57).

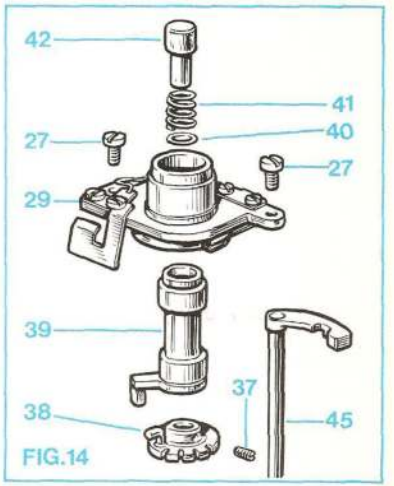
Reassembly of the mirror box and cam assembly.

FIG. 13

(i) Replace the mirror lifting mechanism assembly (11) by replacing the three screws (10). The cam and gear must be retensioned by 1½ to 2 turns. The cam may require adjustment when the mirror box is fitted.

(ii) Replace the mirror box assembly (28) with the three fixing screws (26).





(iii) The leading edge of the mirror lifting cam should be positioned just in front of the mirror lifting arm. To check the correct position of the cam, fire the shutter, and with the blinds in the fully open position the cam should just be holding the mirror in the 'up' position. When the second blind is released the mirror should drop fully to the viewing position. The cam can be adjusted by releasing the screw (187) and raising the cam slightly, to clear it from the gear, while holding the gear firmly in position. The position of the cam can then be adjusted, and the cam re-secured. The tension of the cam is adjusted by means of the adjusting mechanism visible through the recessed aperture in the blind bearing plate. See 'Blind tensioning and adjustment'.

Reassembly of the speed selector mechanism

FIG. 14

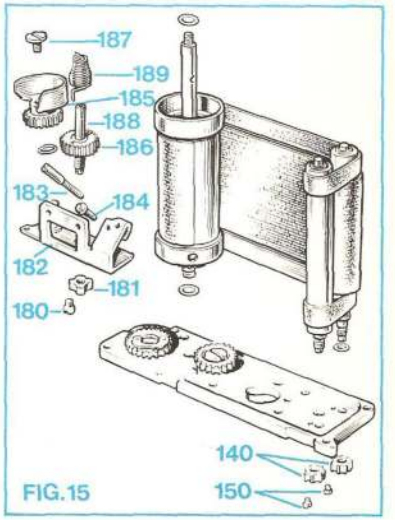
(i) Replace the speed cam (38) by means of the screw (37). The flash contact should be in the 4 0'clock position.

(ii) Replace part Nos (39), (40), (41), (42).

Blind tensioning and adjustment

FIG. 15

(i) The blind tensioning adjustment screws are situated on the blind bearing plate (149), locked in place by lock nuts (140), which in turn are secured by locking screws (150). There are two blind tension adjustment screws at one end of the blind bearing plate: The one nearest the back of the camera is the first blind adjustment, the one nearest the front of the camera is the second blind adjustment. There is a third adjusting screw, which is situated in the recessed central hole in the blind bearing plate. This is the tension adjustment for the mirror lifting cam, and also tensions the first blind.



(ii) As a general guide, the first blind requires considerably more tension than the second blind.

FIG. 15

When the shutter is fired on 'B' the second blind should have just sufficient tension to cause the blind to travel the extent of the frame when the shutter is released.

(iii) A convenient, and rapid, method of setting the correct shutter speeds is to set the '500th' speed. When this is correct, and giving an even exposure across the full width of the frame, the other speeds will be found to be within acceptable limits of speed tolerance.

(iv) To increase the speeds, increase the tension on the second blind. However if this causes cut-off to appear on 500th, decrease the tension on the second blind until the cut-off is removed, then decrease the first blind tension until the correct speed is obtained. If further first blind adjustment is required, this may be obtained by adjusting the mirror lifting cam/first blind adjusting screw, situated in the recessed hole in the centre of the blind bearing plate.

(v) To adjust blind tensions, proceed as follows: Unscrew the locknut securing screw (150). Insert a screwdriver blade into the central 'screw head' end of the blind roller shaft. Holding this firmly in place, unscrew the locking nut (140) which has a left-hand thread, and must therefore be rotated clockwise. When the locking nut is loose, blind tension will be felt on the screwdriver. To increase blind tension, turn the screwdriver anti-clockwise. To decrease blind tension, turn the screwdriver clockwise. When the desired tension is reached, secure the locking nut by turning anti-clockwise. Replace the locking screw (150).

FIG. 15

Reassembly of the top plate

(1) Replace the rewind button (44). Replace

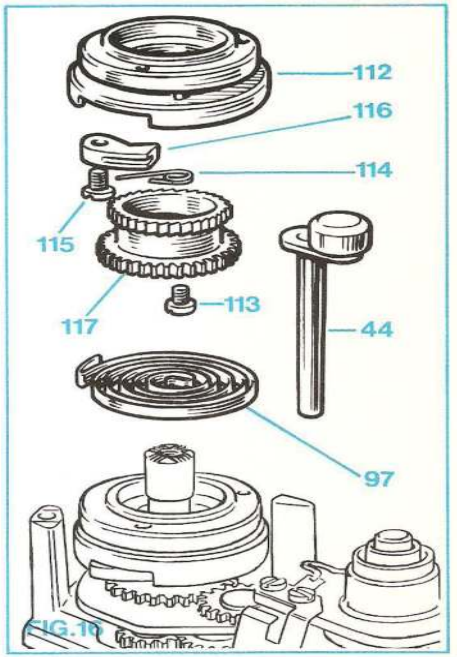


FIG.16

FIG. 16

the flash contact assembly (29).

(ii) Replace the ratchet assembly (112) and attached spring (97). The spring cannot be tensioned at this point.

(iii) Replace the top plate and secure it with the three screws.

FIG. 17

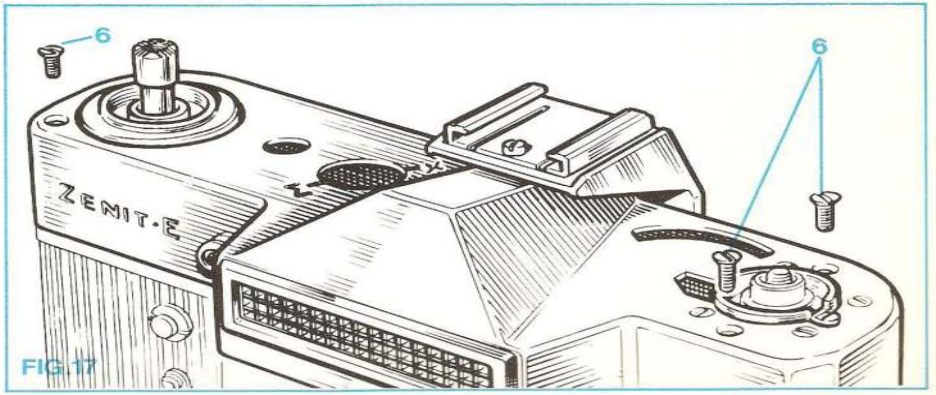


FIG.17

(iv) Tension the leverwind spring by turning the ratchet assembly anti-clockwise until it locks, and the shutter release must be depressed to obtain further travel. Repeat this operation approximatively 2 1/2 times.

(v) Holding the ratchet assembly in position, fix it into place by securing with the three screws (111) through the leverwind assembly (110) and ring (109). On some cameras, the leverwind and ring may be fixed together as one sub-assembly.

FIG. 18

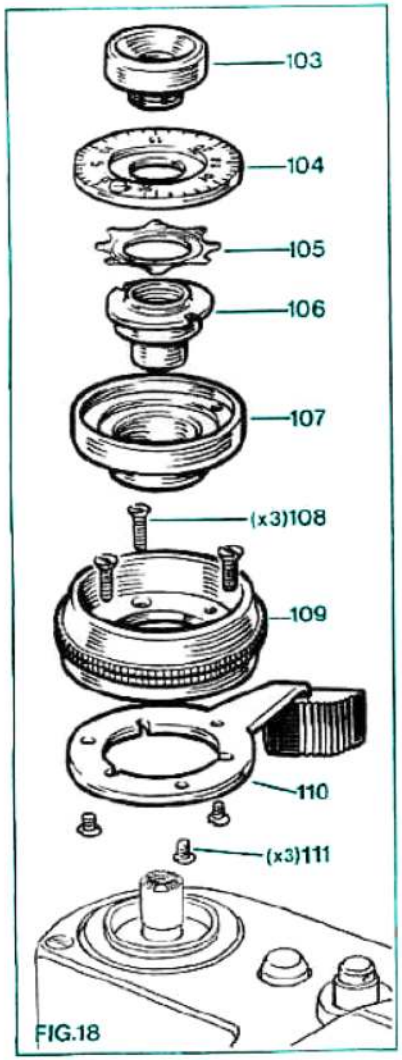


FIG.18

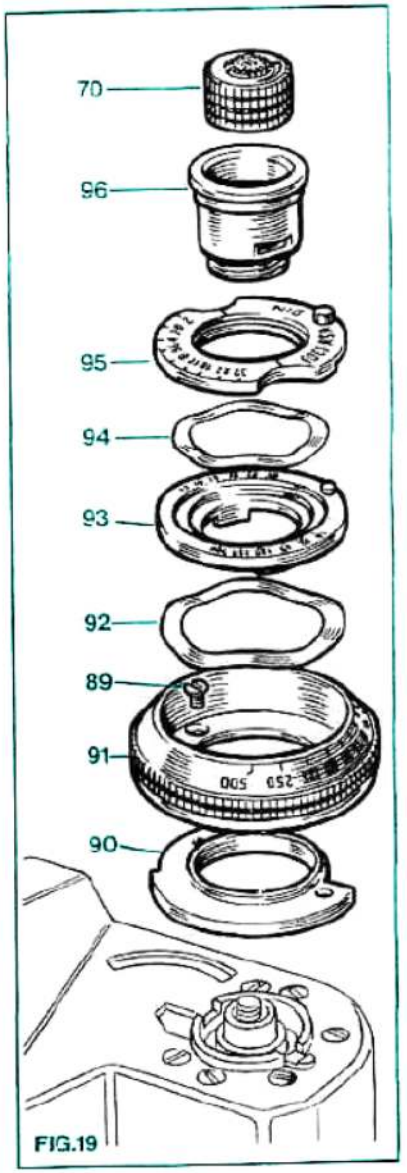


FIG.19

(vi) Replace the ring parts (107), (106), (105), (104), and (103), noting that parts (103), (106), and (107) are left-hand threaded.

(vii) Resecure meter follow-pointer dials etc. (parts 90-95 incl.) by means of nut (96).

FIG. 19

FIG. 13

Ancillary mechanisms

Flash Synchronisation

Flash Synchronisation is controlled by one self-contained assembly (29), with a forward facing spring plate, which contacts directly with the rear of the socket in the top plate, when the top plate is in place.

The first part of the flash circuit is normally 'open' (i.e. there is no through circuit) until the release button is depressed slightly. This depresses the second blind holding lever (45) thus allowing the contact breaker to make contact with the contact plate. This contact breaker is situated on the upper face of the flash assembly (29) on most models, but is on the lower face of the assembly on some earlier models.

Adjusting the synchronisation

The synchronisation is adjusted by revolving the large collar on the flash assembly, thus revolving the flash synchronisation timing ring. For 'X' (electronic flash) synchronisation the ring should be in a position close to the furthest clockwise extent of its travel, but it should not be in actual contact with the raised flash firing contact on the speed selector (38).

Checking the synchronisation

A convenient method of checking the synchronisation is to use an electronic flashgun and observe whether the full film frame is covered by the 'flash' when the shutter speed is set on 1/30th. This can best be checked by placing a metal plate over almost the full width of the film frame when making the test, leaving only a small gap at one side of the film frame to check for flash coverage at that side. This is then repeated for the other side of the film frame. The synchronisation may be adjusted during these tests by temporarily replacing the 'X-M' lever (102). When the correct position for 'X' synchronisation has been determined the lever may be removed, and then replaced to align correctly with the 'X' synchronisation mark on the top plate. To obtain 'M' synchronisation the flash should fire when the first shutter blind has travelled 4 to 9mm across the film frame.

Exposure meter unit

The exposure meter unit consists of two assemblies, the coil assembly and the cell assembly. Both are situated beneath the top plate, and are fixed to the top plate when this is removed from the camera.

The meter setting dial assembly (parts 90-96) must be removed to enable access to be gained to the top plate securing screws. However once the top plate is removed from the camera it is convenient to replace the dial assembly when working on the meter.

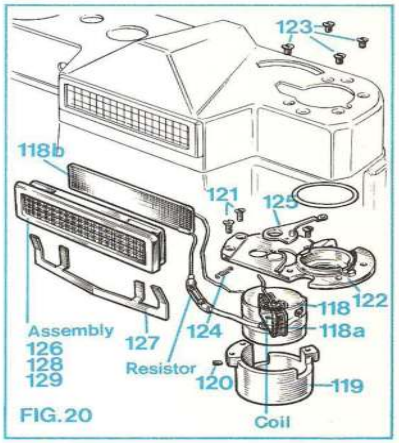


FIG.20

Access to the cell is gained by unclipping the meter cell securing plate (127). The cell can then be removed.

The normal method of rectifying an exposure meter reading error is to replace the cell. This is because the normal cause of meter error is cell exhaustion, which is progressive. Replacement of the cell resistor will therefore effect a temporary cure, but not a permanent one.

The two wires from the cell are removed by unsoldering. Leave the existing cell resistor in place, and fit a new cell into the circuit. Check the meter calibration, and replace the resistor if required. If more meter movement is required a resistor of lower value should be substituted. If less meter movement is required a resistor of higher value should be substituted. Ensure that the screened lead is fully insulated from the camera body and top plate at the joint points.

As a guide, the difference of I K Ohm in the resistor value will equal slightly less than one stop of meter reading. In practice, it will be found that the meter will give a deflection of approximately half a stop less when the lens is fitted, to the reading obtained without a lens. This is due to the partial screening effect of the lens to the cell, and should be allowed for by obtaining a reading approximately half a stop higher than required, when a lens is not fitted.

Delayed action mechanism

The delayed action train is situated behind the sprocket cover plate (47).

(i) Remove the camera base plate, shutter release spring plate (64) and part no's 61 and 62 if these parts are not already removed from the camera.

(ii) Withdraw the main shutter release shaft (60) and unscrew the take-up spool retainer (32) which is situated inside the central core of the take-up spool (25).

(iii) Remove the take-up spool retaining assembly and the take-up spool. Remove the sprocket cover plate (47) by means of the four screws (46).

(iv) Remove the delayed action lever (191) from the front of the camera by removing the securing screw (190) which has a left-hand thread.

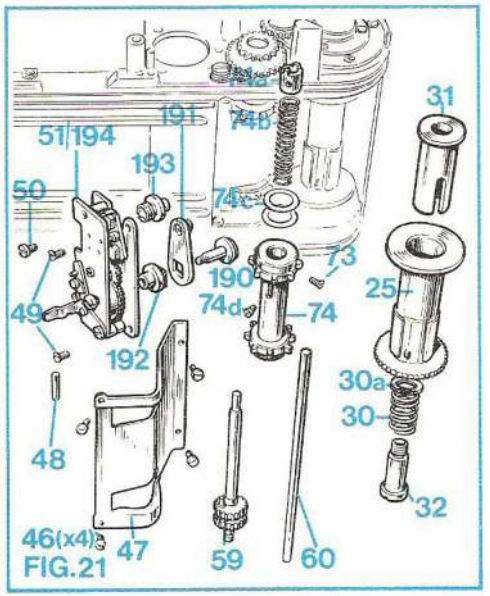


FIG.21

(v) The delayed action assembly (51/194) may now be removed, if required, by removing the three securing screws. (49 & 50).

The Helios 44 lens

Dismantling the Helios 44 F2 58mm Lens

The lens comes in two main sub assemblies. The optical unit fig. 22 (including the iris) and the focusing mechanism fig. 23.

The front part of the lens can be detached from the rear part by holding each part and turning anti-clockwise. (Take care not to lose the focus spacing rings).

The Optical/Iris Sub Assembly

This assembly will have to be dismantled completely or partly to repair the iris or clean the optics.

1. Remove the rear optical assembly (3/21) complete.
2. Remove the rear iris ring (3/18) by loosening the three grub screws (3/25) retaining it.
3. Remove the large countersunk screw (3/17) from the ring (3/16) which is now exposed.
4. Note number of threads visible at the rear of this cage (3/15).
5. Mark position which screw (3/27) is fitted (against correct slot) and remove (3/16).
6. *To repair or replace iris leaves:* Remove the one grub screw (3/26) visible half way down the assembly. The rear parts can now be removed including the iris.
7. *To remove the iris leaves:* First note screw hole should be full left (with the rear of the assembly down). Remove the large circlip, remove the cage (3/13), the leaves can now be removed for cleaning or replacement. The iris leaves should be refitted in a clockwise rotation. The last few have to be located under the one's first laid down. When all the leaves are in place, refit the cage and make sure the screw hole is far left of the slot as when it was removed. Replace the circlip.

   Note the round edge of the leaf goes down, the pointed end goes up into the cage assembly.
8. *To replace the front lens mount assembly (3/32):* Remove ring with serial number (3/28), remove optics with care, loosen the three grub screws (3/37) retaining the pre-set iris ring and remove the ring (3/36). Remove grub screw (3/34) from click stop assembly and remove the assembly complete. (Unscrew anti-clockwise). The lens mount assembly can now be replaced, if required. Reassemble in reverse order. Take care not to lose the roller (3/41) from the click stop assembly.
9. Refit pre-set ring making sure grub screws fit into indentations and that F number lines up with the red dot.
10. Refit rear assembly (3/15) including iris. Replace grub screw (3/26).
11. Refit iris control ring (3/16).
12. Refit screw (3/27) into cage (3/15) when noted number of threads are visible. Refit countersunk screw (3/17). Refit lower iris ring (3/36). Check alignment of red dots at F.16. Both red dots should be in line with the iris fully open.
13. Replace the optics after cleaning.

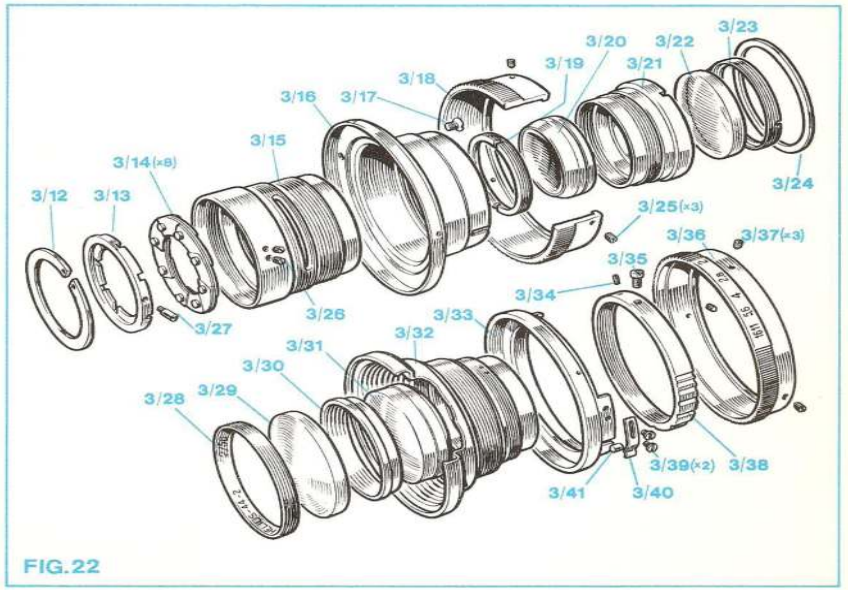


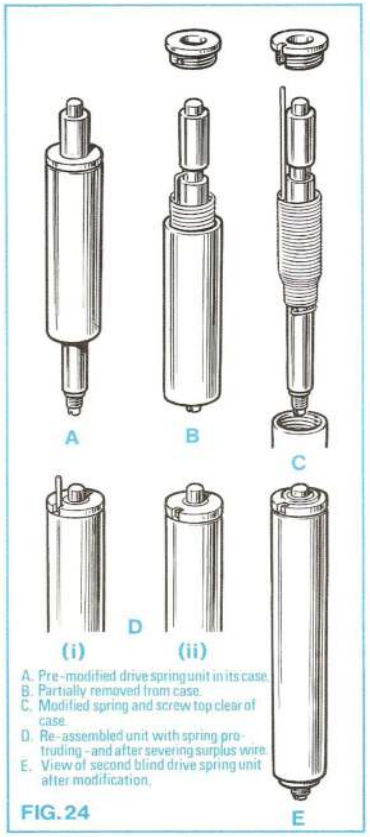
FIG.23

The Focus Assembly

1. Screw the focusing mechanism fully into the infinity position.
2. To dismantle, loosen three grub screws (3/11) in the focus ring (3/10) and remove, make mark at infinity position this will aid location of lens rings, loosen three grub screws (3/1) in the depth of field scale (3/2) and remove. Mark ring (3/9) so it can be refitted in the same position. Loosen grub screws (3/8) and unscrew ring in an anti-clockwise direction and remove. Pull rear of the mount off (3/7).
3. Remove the stop screw (3/5) now visible. The remaining outer thread of the focusing mechanism can now be removed but mark the position it comes off, so that when it is replaced it will come to the same position against the infinity stop.
4. Clean and regrease as required and reassemble in reverse order. Note all screws should be glued where possible to prevent loosening due to vibration etc.

FIG.22

Factory recommended modifications



A. Pre-modified drive spring unit in its case.
B. Partially removed from case.
C. Modified spring and screw top clear of case.
D. Re-assembled unit with spring protruding - and after severing surplus wire.
E. View of second blind drive spring unit after modification.

FIG. 24

Shutter Assembly—Drive shafts

The object of this modification is to eliminate unnecessary friction caused by the drive spring from 'biting' into the drive shaft. This can cause heavy transport and an excessive amount of tension on the spring in order to maintain correct shutter speeds. Both first and second drive spring units must be modified, procedure is identical the only difference is in the length of outer casing on the shaft (as shown in Fig. 24A and 24E). Before modification remove lubrication and clean springs. After modification re-lubricate springs.

FIG. 24

Modification is carried out as follows:—

Remove drive spring and shaft from outer casing (Fig. 24B). With a slotting file make a small vertical groove in screw top of outer casing (Fig. 24C). The drive spring itself, which is modified by bending it so that it is vertically adjacent to the shaft (Fig. 24C), will seat in this newly cut groove. This modification also obviates the need to use spring retaining aperture in casing screw top (Fig. 24B) since the modified spring and screw top are mated together and screwed home into the outer casing (Fig. 24D-i). Once correct positioning of drive spring is achieved the surplus spring is severed so that none protrudes from screw top of outer casing (Fig. 24D-ii).

Back catch

The purpose of this modification is to prevent the back catch of the camera coming open accidentally (for example when inserting the camera into its ever-ready case.)

The two screws (154) are removed from the back catch cover plate (153). Remove cover plate and catch (152). With a small hammer tap point "A" shown in figure 26 gently with the object of bending it downwards *slightly*. (The amount of set being determined by the smoothest operation).

Now with a round needle file, make a small indentation at point "B" shown in figure 26. This will act as the retaining position for the back locking pin. Then reassemble and test. The closing catch should then be bent slightly in an upward direction where indicated by the dotted line so that it locks with the cover plate when the catch is depressed. This will effect a complete and satisfactory modification.

FIG. 25 & 26

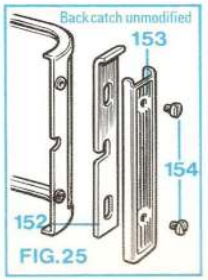


FIG. 25

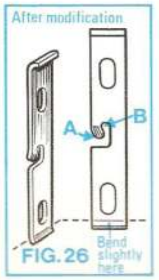


FIG. 26

Common faults and their rectification

Exposure meter out of calibration

If the meter error is slight it can be rectified by replacing or removing the resistor in the meter circuit. However if the error is more than half of a stop this will not effect a permanent cure, as it is likely that the photocell is partly exhausted, and will rapidly weaken with use. The normal method of correction is therefore to replace the photocell. (See 'Exposure meter unit').

Shutter blinds sticking or sluggish

Remove, clean and lubricate the mirror lifting mechanism, retension springs as required. Clean and lubricate main blind bearing under second blind holding cam. Lubricate all other bearings as required.

Heavy or rough winding

This can be caused by excessive tension on the blinds or mirror lifting mechanism, retension correctly. Lubricate and clean the winding gear bearings, in particular the sprocket drive gear bearing.

Flash will not operate

Clean and adjust all flash contacts, including the flash input socket. Replace any worn or corroded parts. (See 'Flash synchronisation').

Flash fires while winding on

This is caused by incorrect positioning of the flash contact breaker assembly. The circuit should be 'open' while winding on, and 'closed' only when the shutter release is depressed slightly, ready for the final contact to be made by the raised pin on the speed selector. (See 'Flash synchronisation').

Shutter release knob will not depress

A possible cause of this fault is the use of a tripod with a non-standard length screw, longer than the tripod bush on the camera. This can break or damage the tripod bush, and thereby jam the shutter release shaft. Replace the tripod bush.

Light leak in camera (See also p20 for factory recommended modification to back catch)

There are six commonly encountered causes of light leaks or apparent light leaks.

(i) Light baffle (55) is too far away from film plane, or incorrectly mounted. Move closer to film plane, or check mountings, ensuring that it does not interfere with the travel of the second blind.

(ii) Screw missing from base plate—replace screw.

(iii) Damage to tripod bush caused by using tripod with longer screw than the bush—replace tripod bush. Alternatively, the light trap washers from the tripod bush may be missing.

(iv) Inadequate light-trapping (167A) around mirror box either side of the prism. Increase or renew light-trapping as required.

(v) Insufficient width of leather covering (176) on back of mirror board (177). Remove mirror board and strip back leather, stretch it so as to increase its width. Replace leather on board, refit board to mirror box fitting length of black wool behind hinge.

(vi) Flare. This can be caused in some models due to inadequate finish of the baffle plate (12). Suitable black flock paper can be fitted to the plate to obviate this.

Note: Users should be advised that lens should be capped while film is being rewound since if the shutter is in a partially cocked position this could result in the first blind only firing when the rewind button is pressed leaving film exposed to light.

Shutter release knob permanently depressed

This is a user-error, not a camera fault. The release button is designed to lock when depressed and twisted. The user may not always be aware of this, and assume that there is a camera fault. To release the button simply turn in an anti-clockwise direction.

Cut-off on right hand side of frame on 500th

There are six possible causes of cut-off, more than one of which may be contributing to the problem.

(i) Blind tension incorrect—retension blinds as detailed under 'Blind tensioning and adjustment'.

(ii) Tension of mirror raising cam incorrect—retension as detailed under 'Blind tensioning and adjustment'.

(iii) Position of mirror raising cam incorrect. Reposition as detailed under 'Reassembly of the mirror box and cam assembly'.

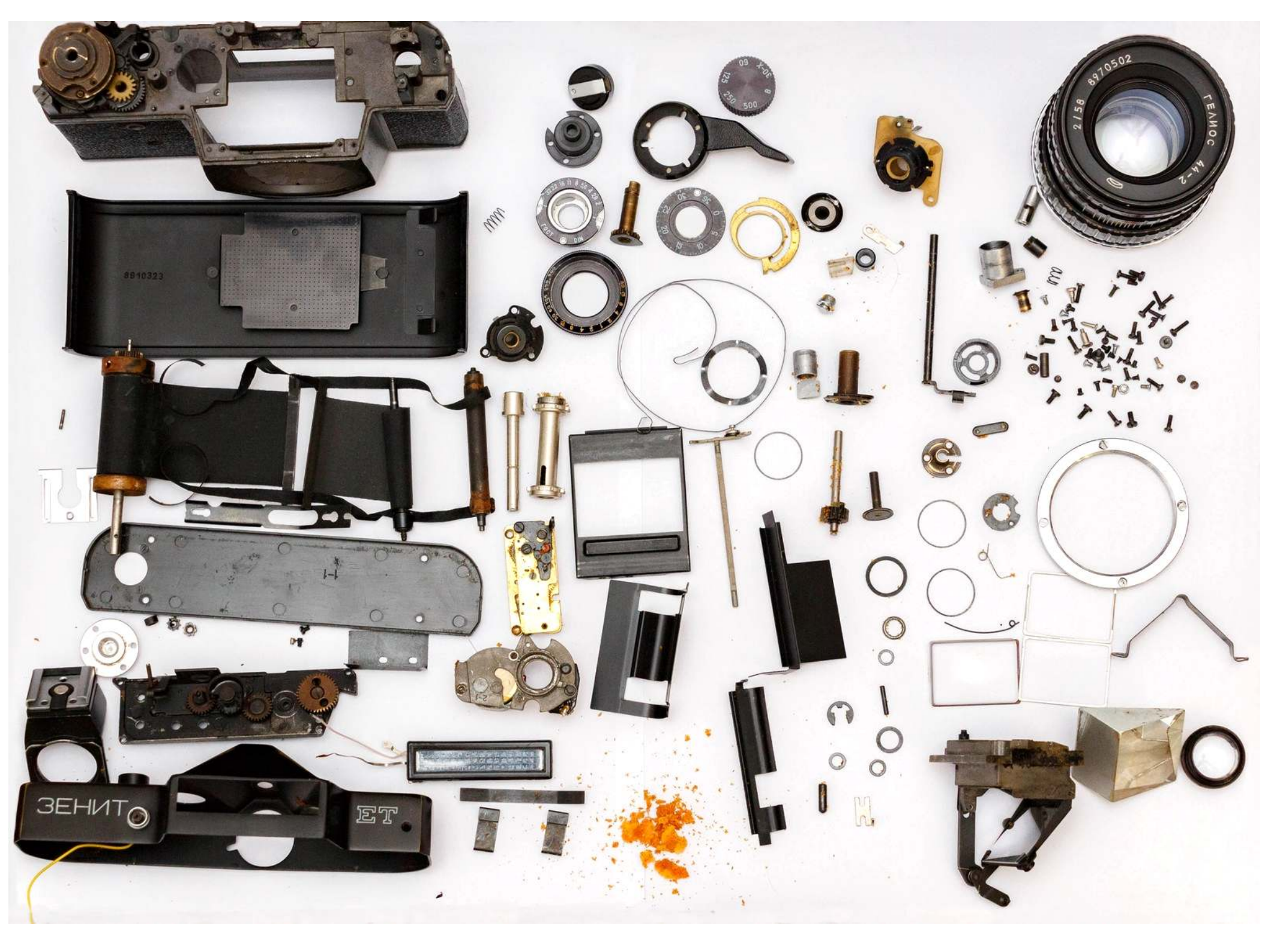
(iv) Position of mirror cam plate (11) incorrect —slacken securing screws slightly, and reposition correctly.

(v) Distortion of the mirror lifting lever bracket (172)—straighten the mirror lifting lever bracket, or replace if required.

(vi) Incorrect positioning of mirror box assembly—slacken the securing screws and reposition the mirror box assembly correctly.

Shutter blinds spring back while winding on

This may be caused by looseness or incorrect spring tension of the shutter release spring plate (64). Tighten the securing screws, ensure that the keyhole slot is correctly engaged, and reform the plate if required. Some early-type spring plates do not have the right-angle 'strengthening pieces' and may bend easily.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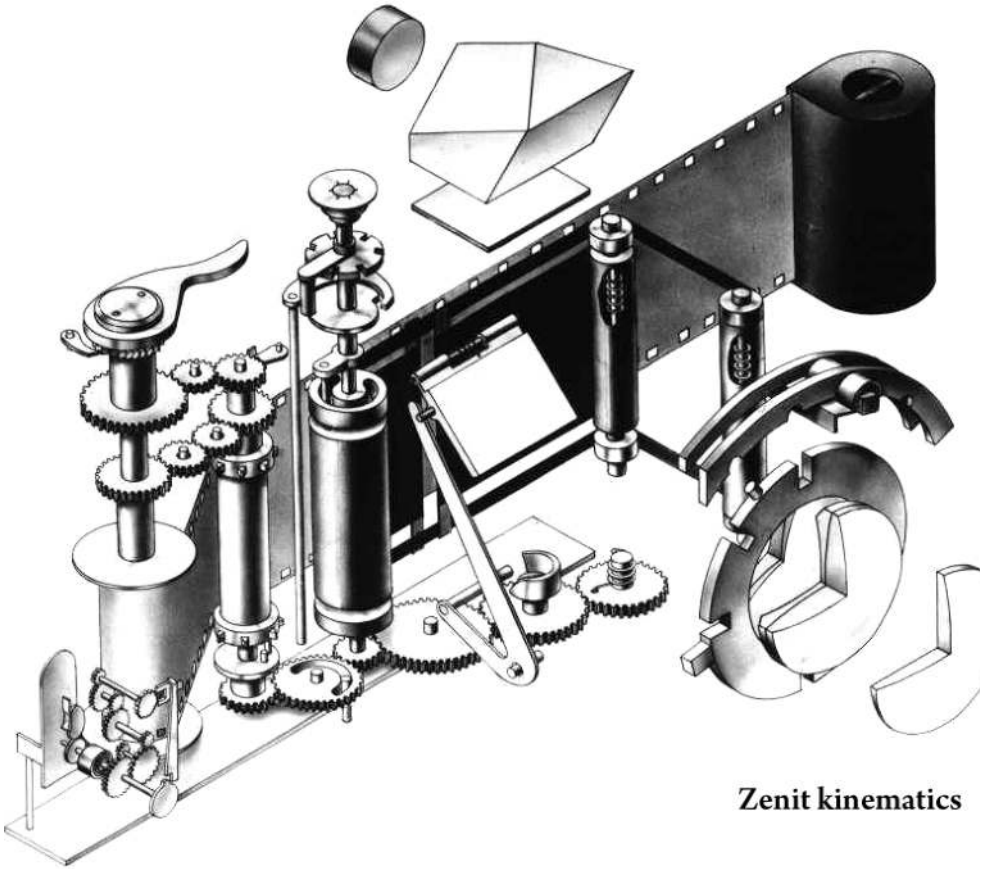
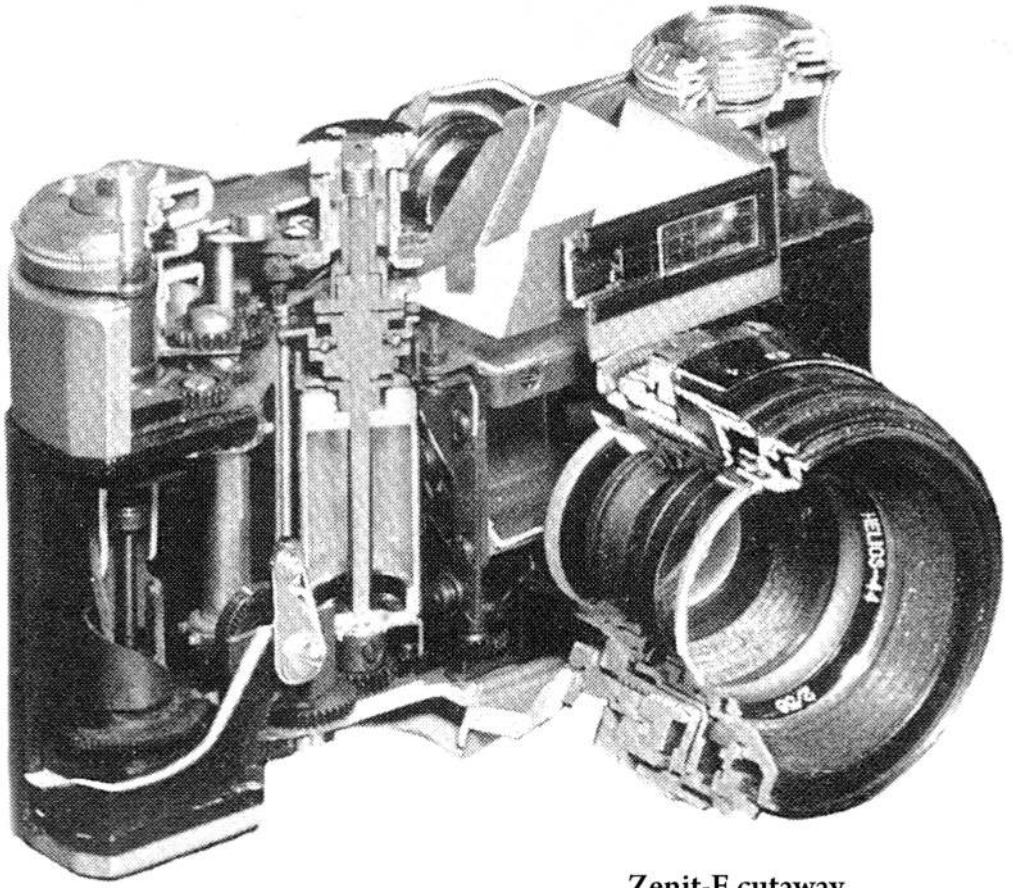
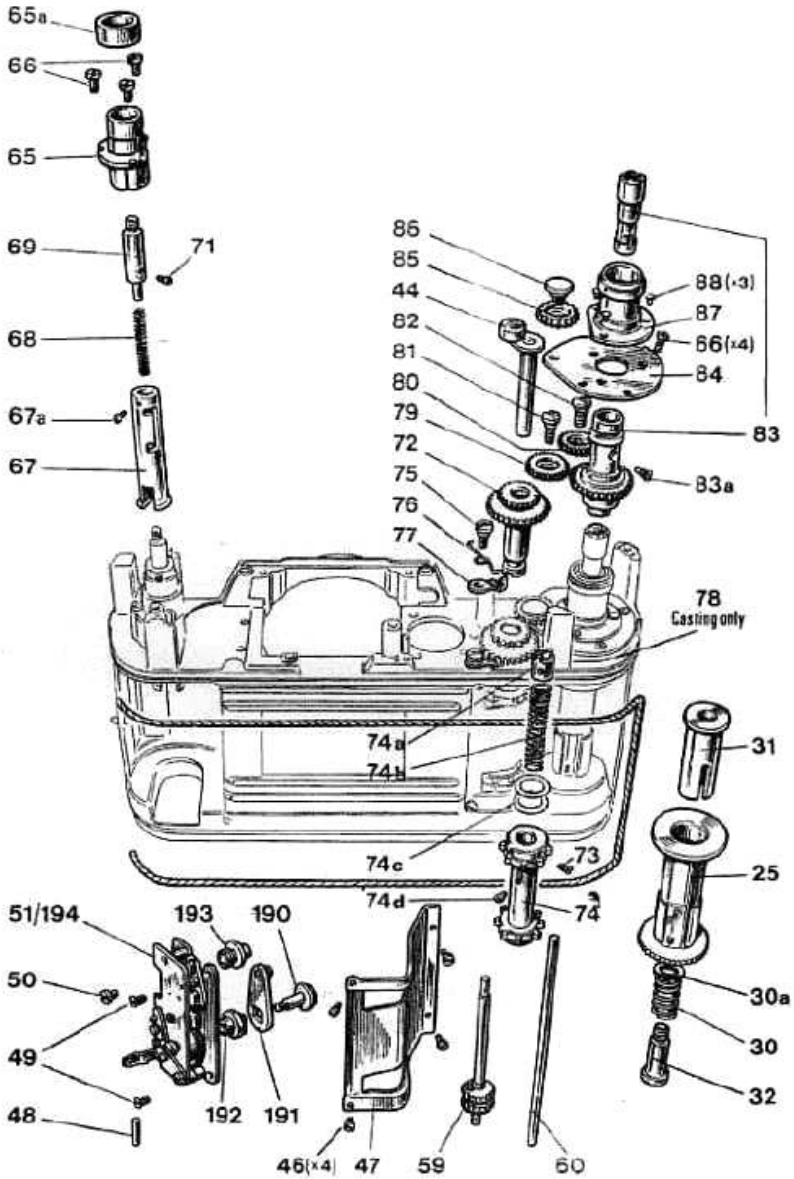


Zenit kinematics



Zenit-E cutaway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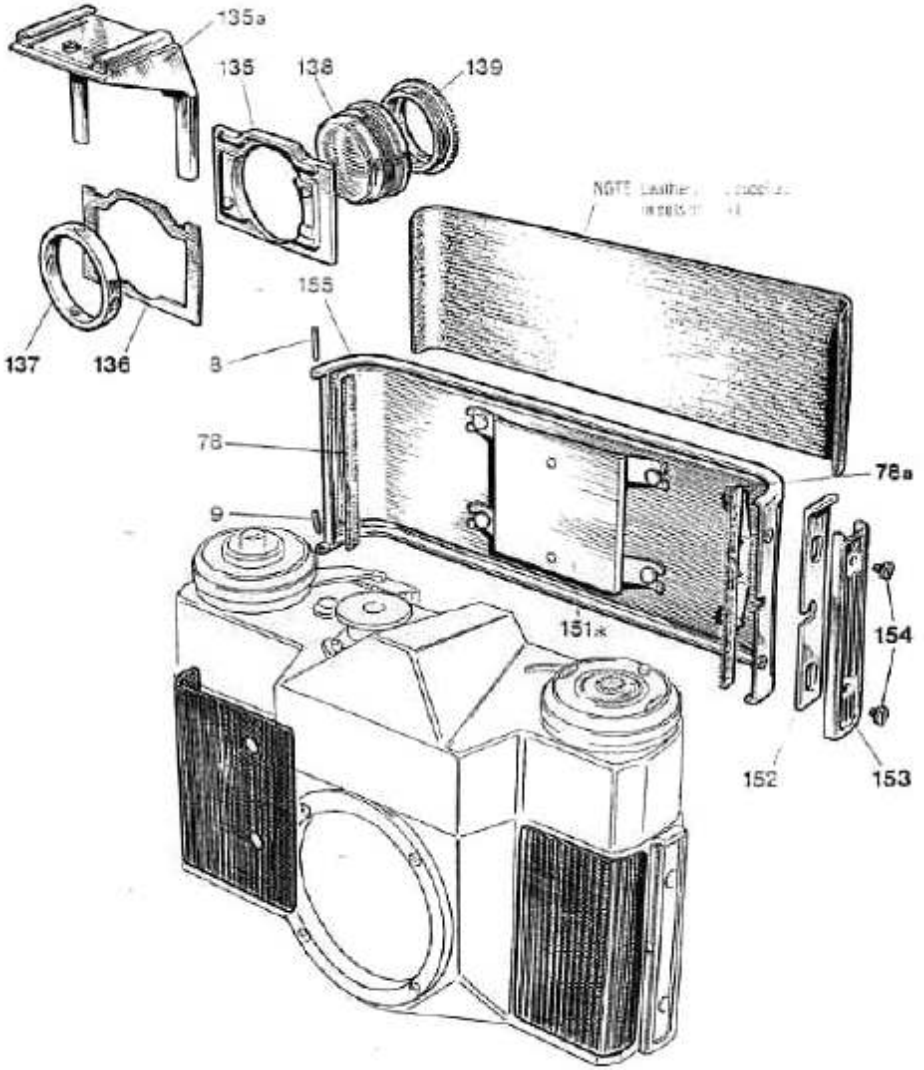
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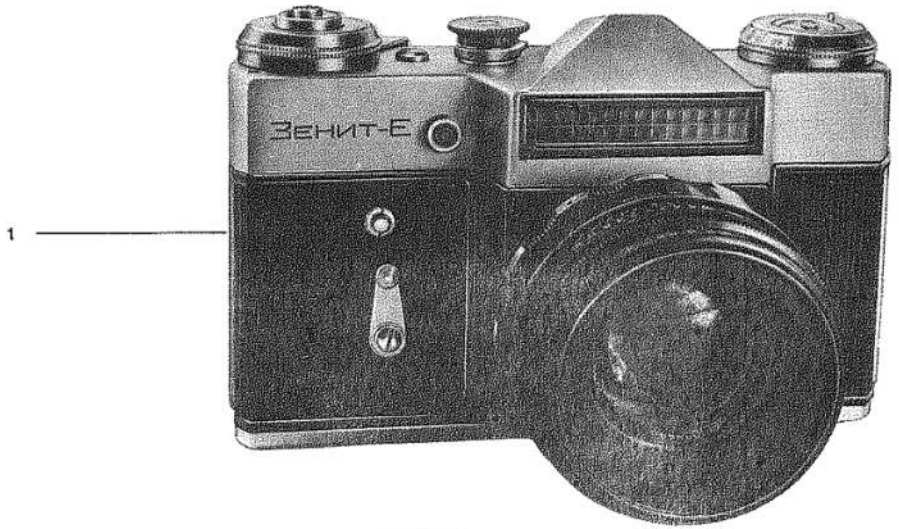

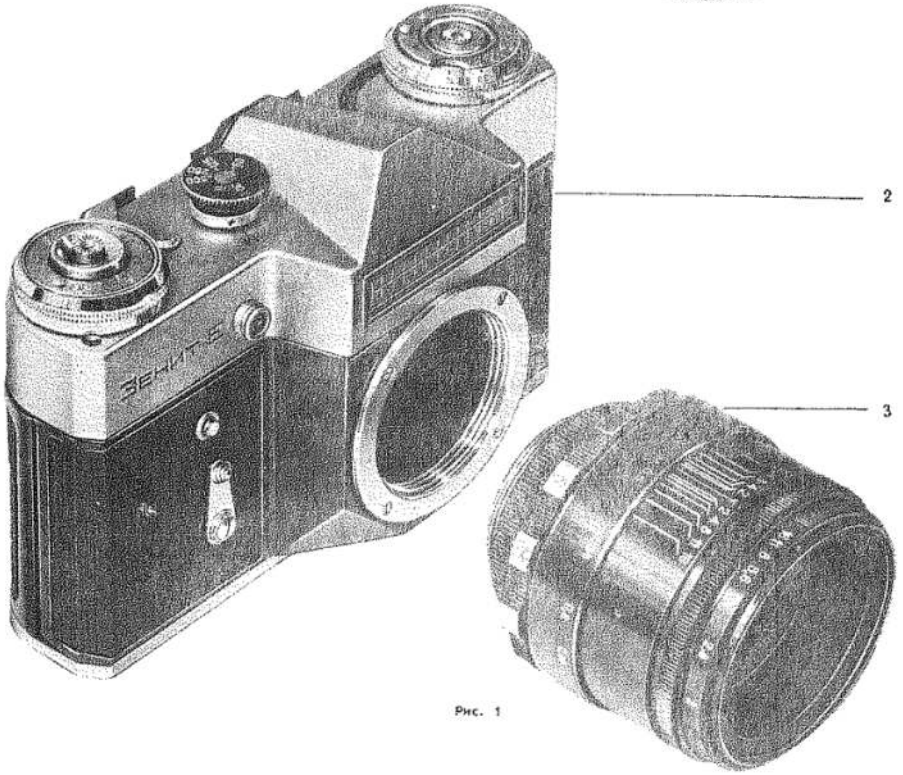

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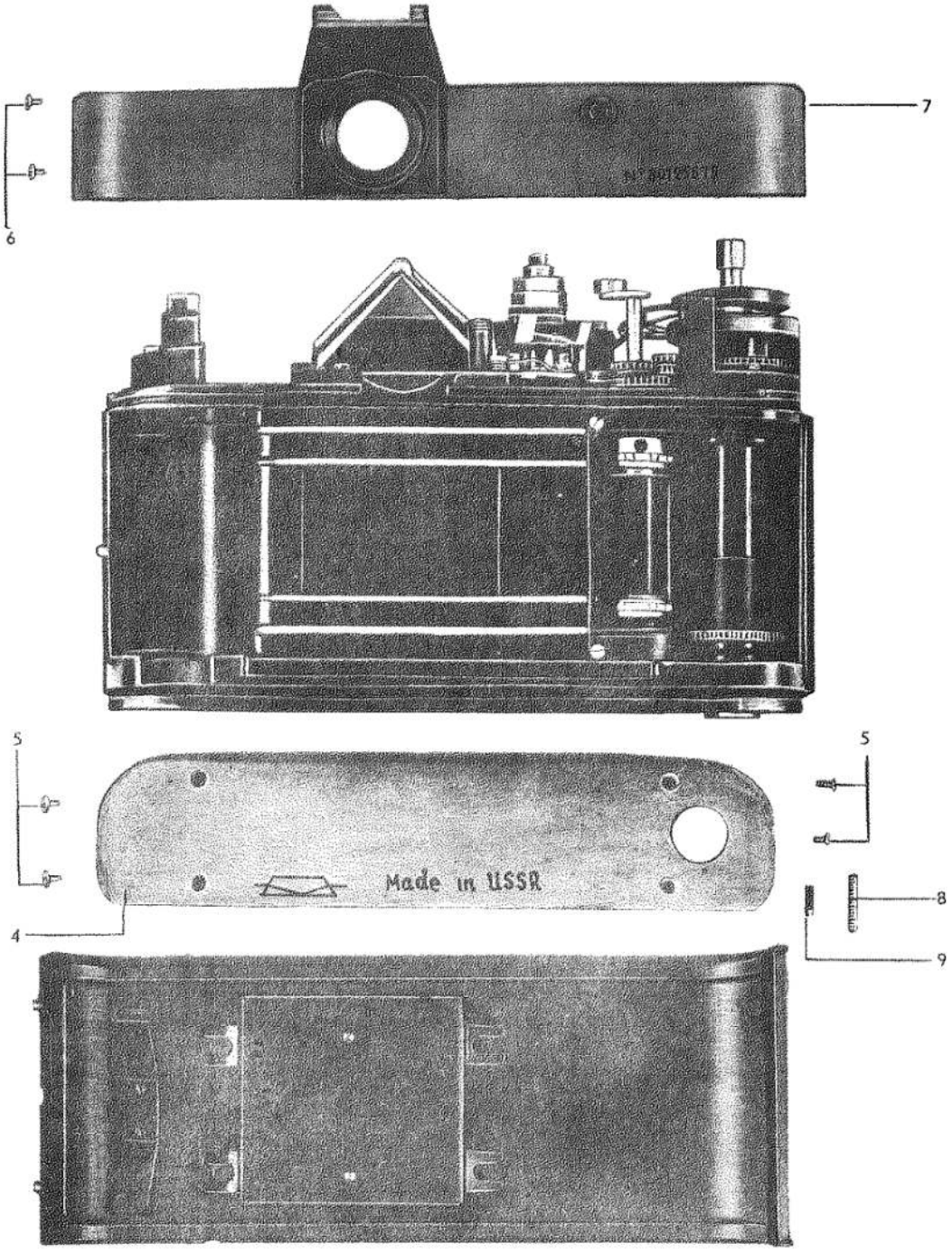

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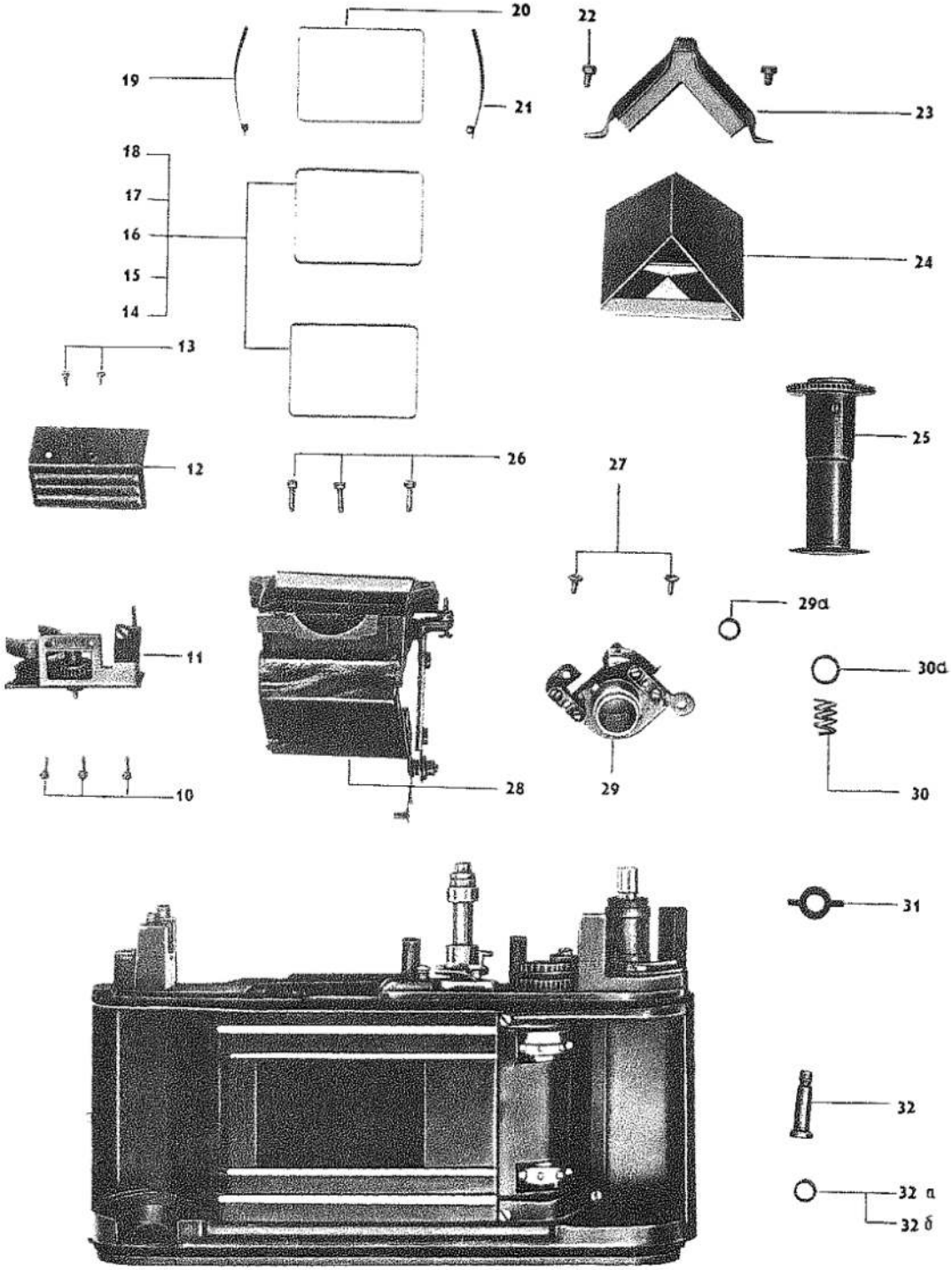
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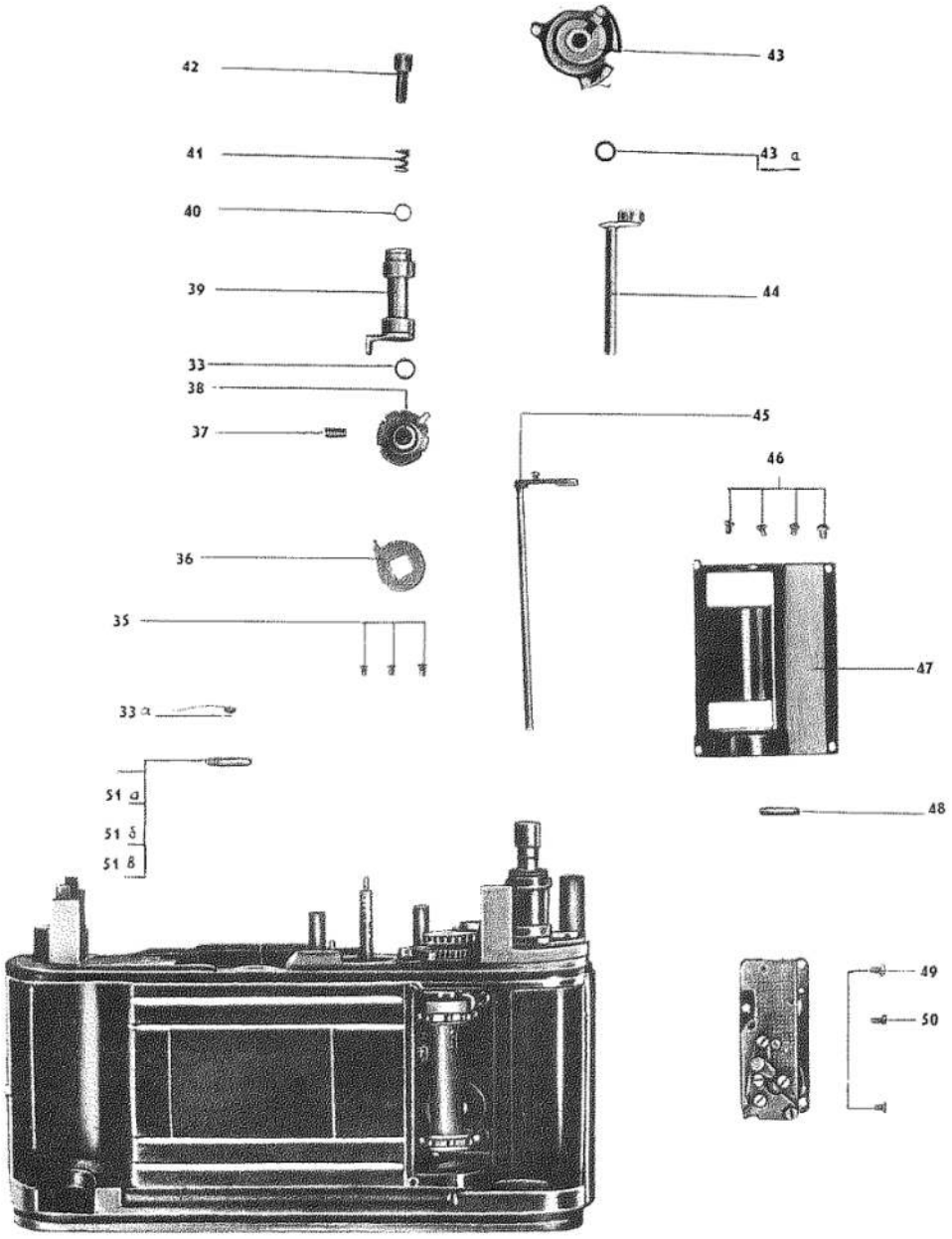
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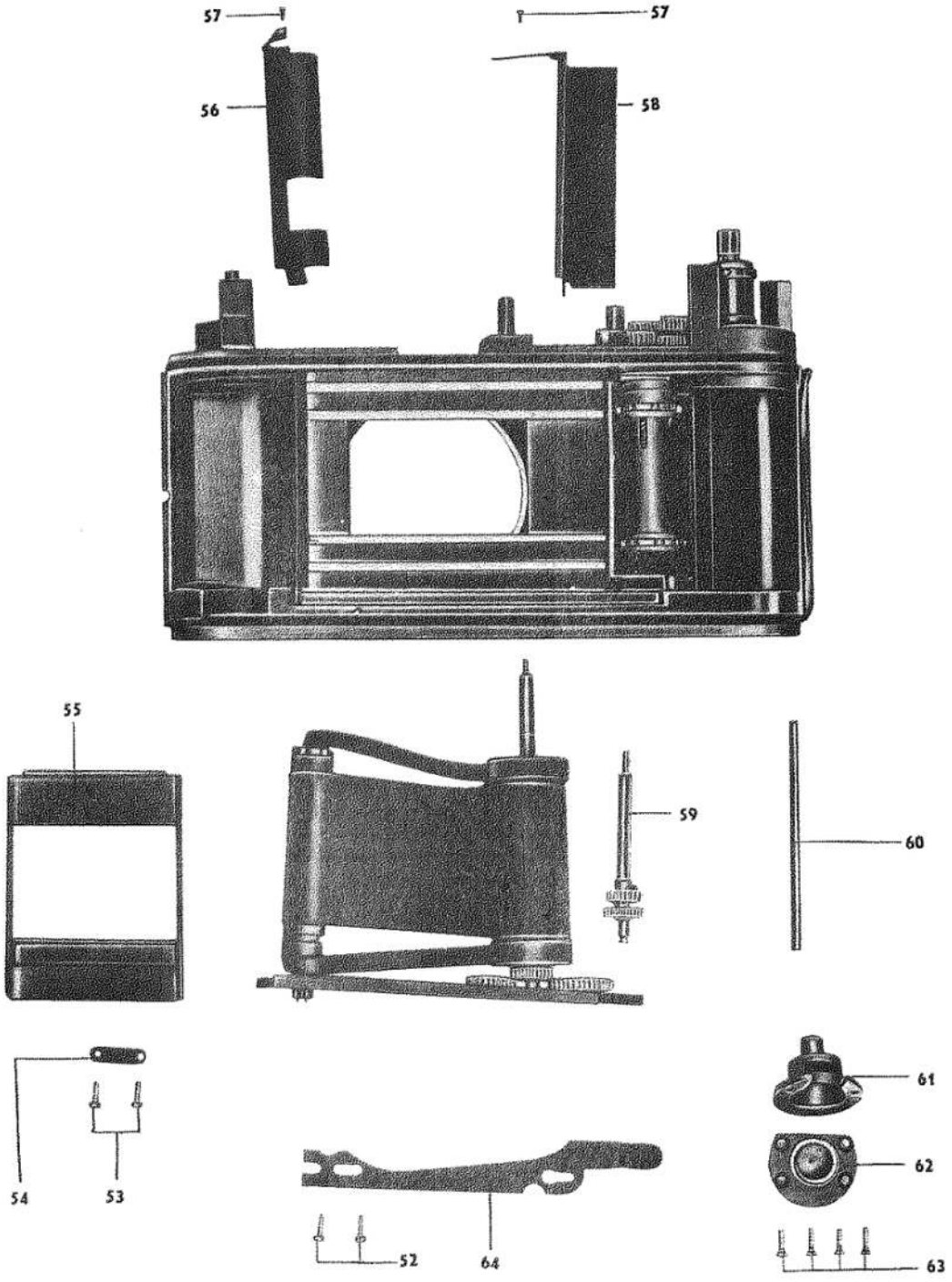
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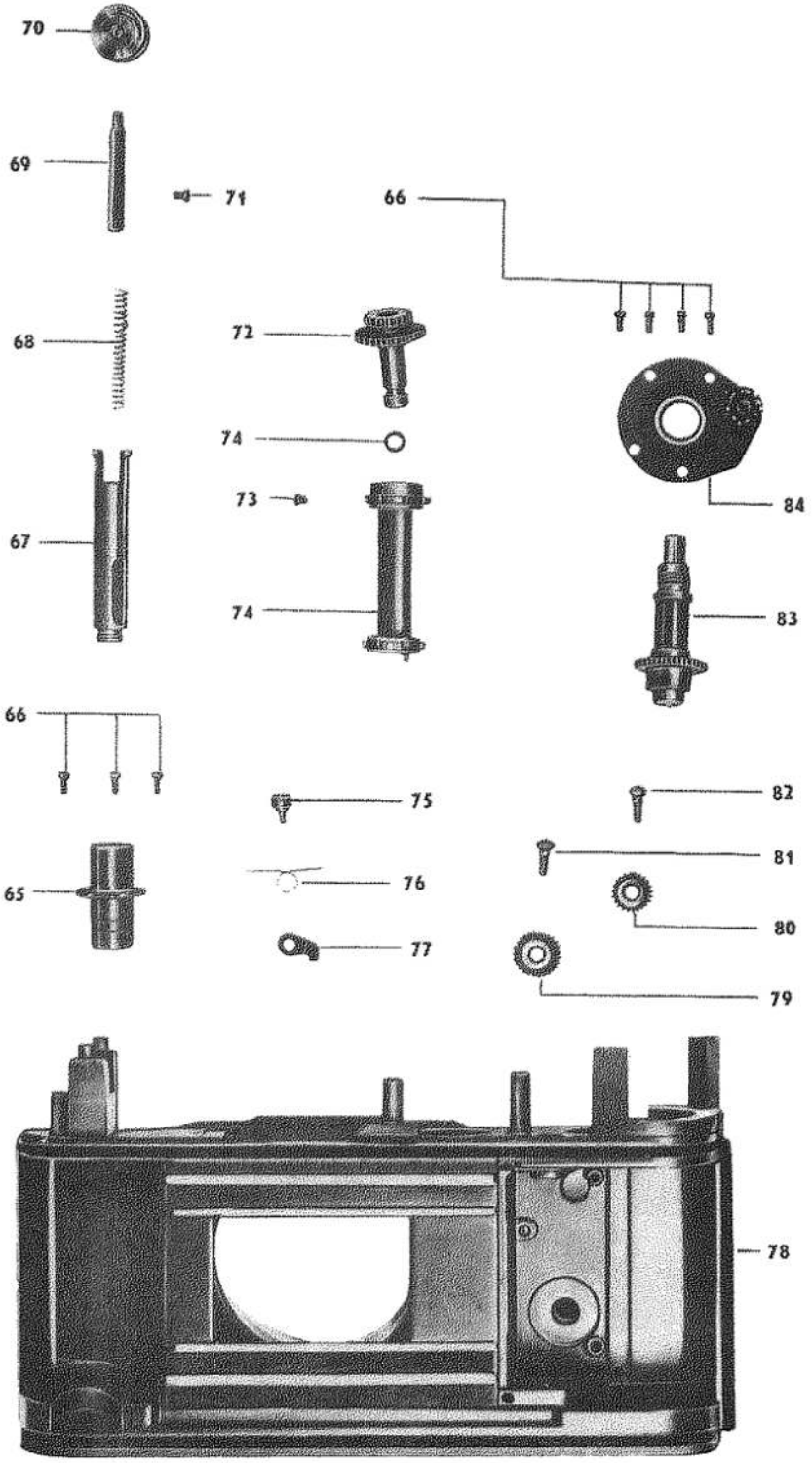
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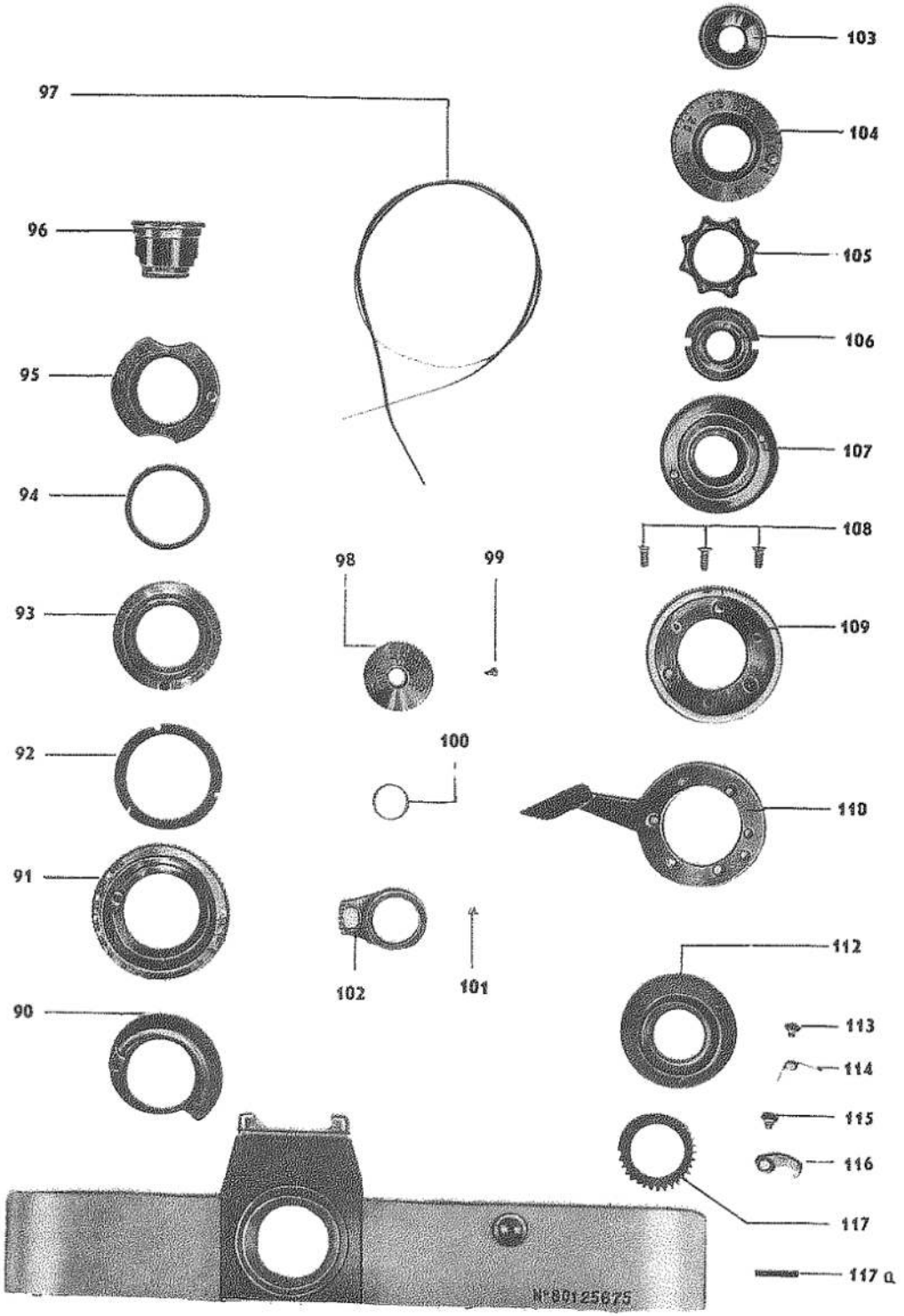
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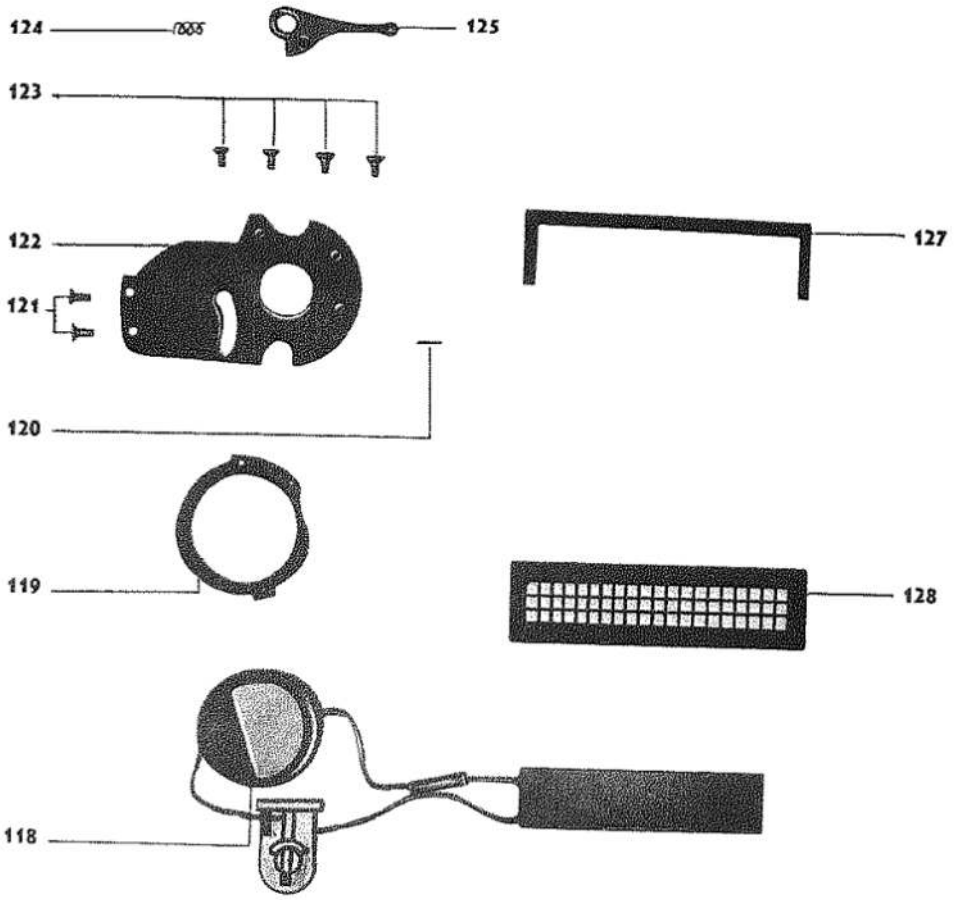
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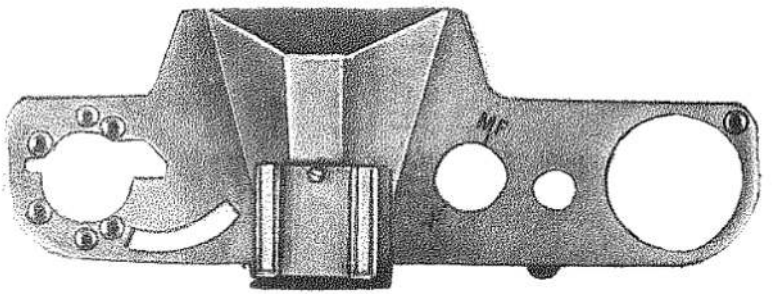
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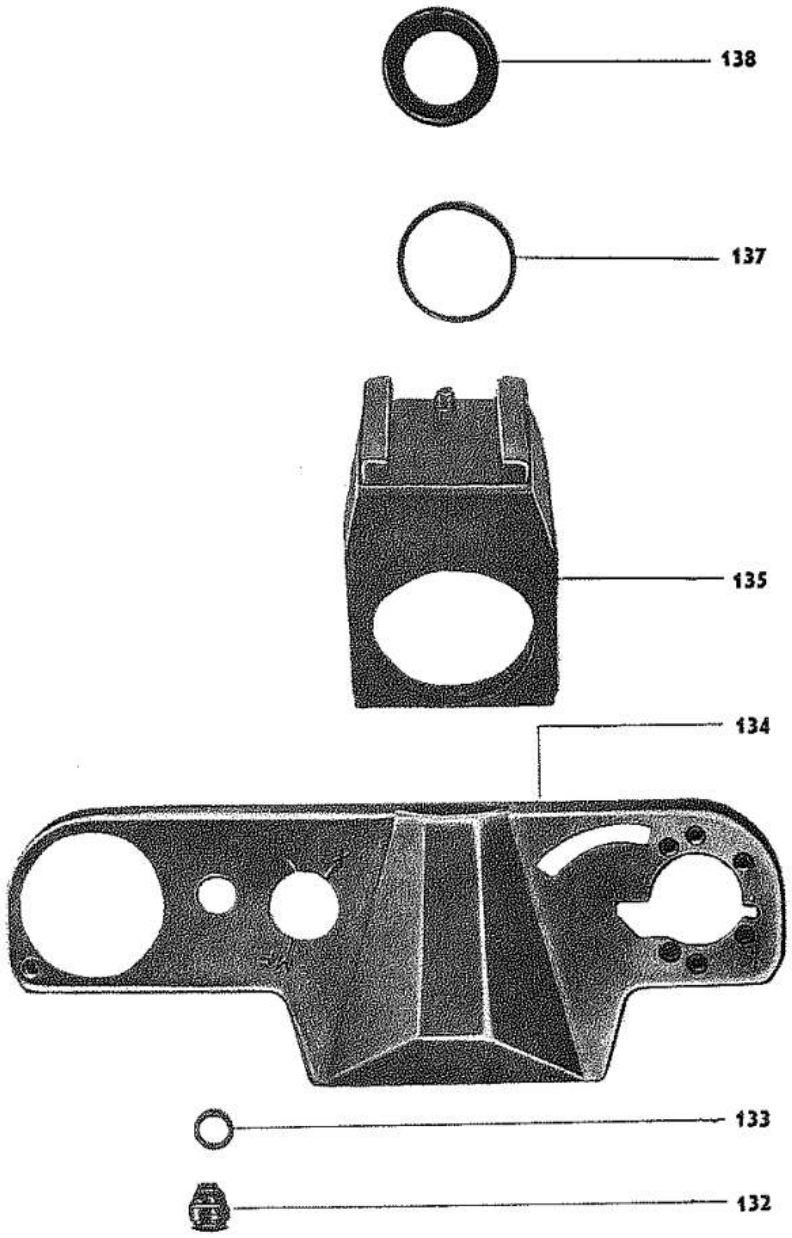
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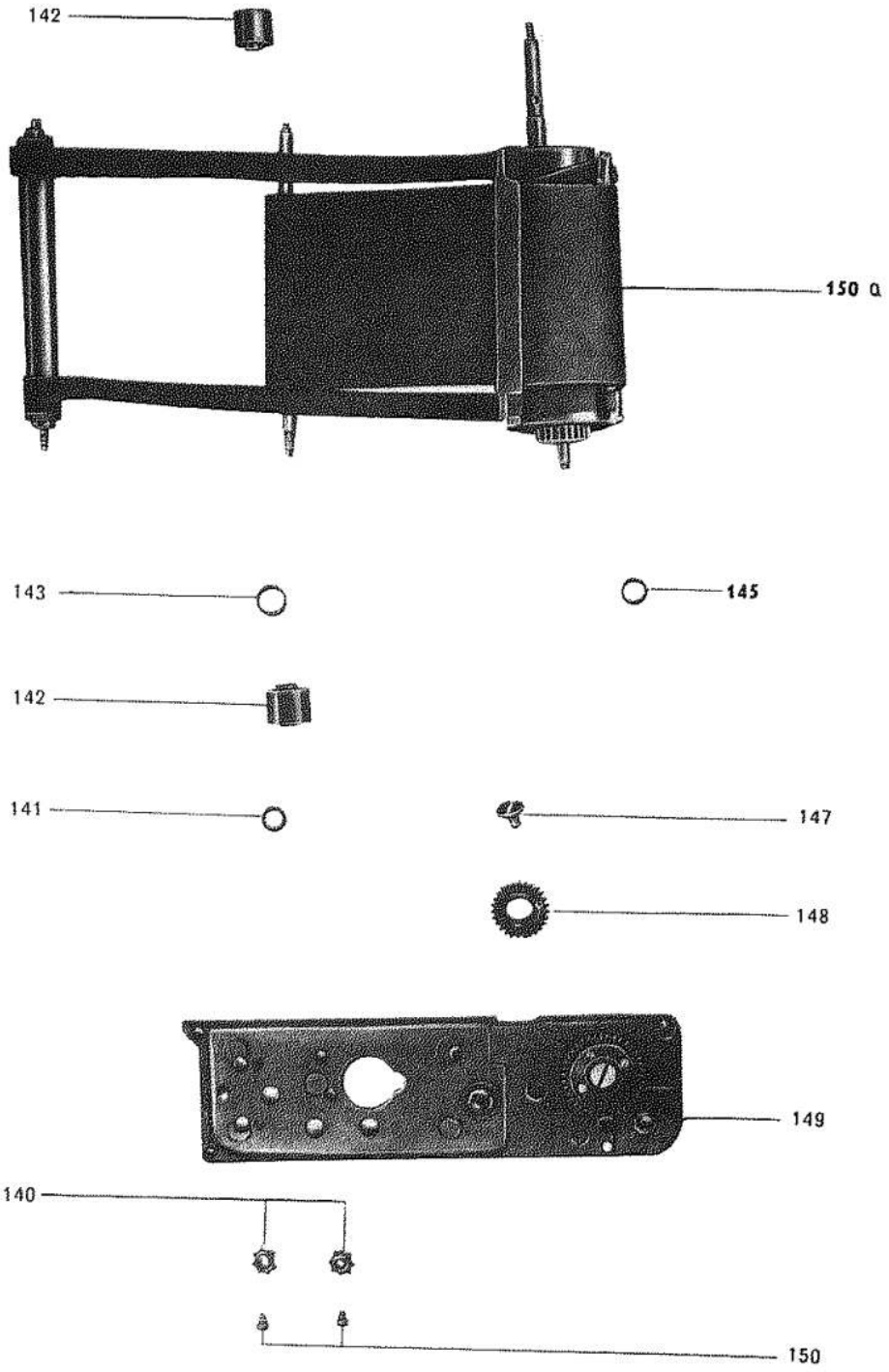
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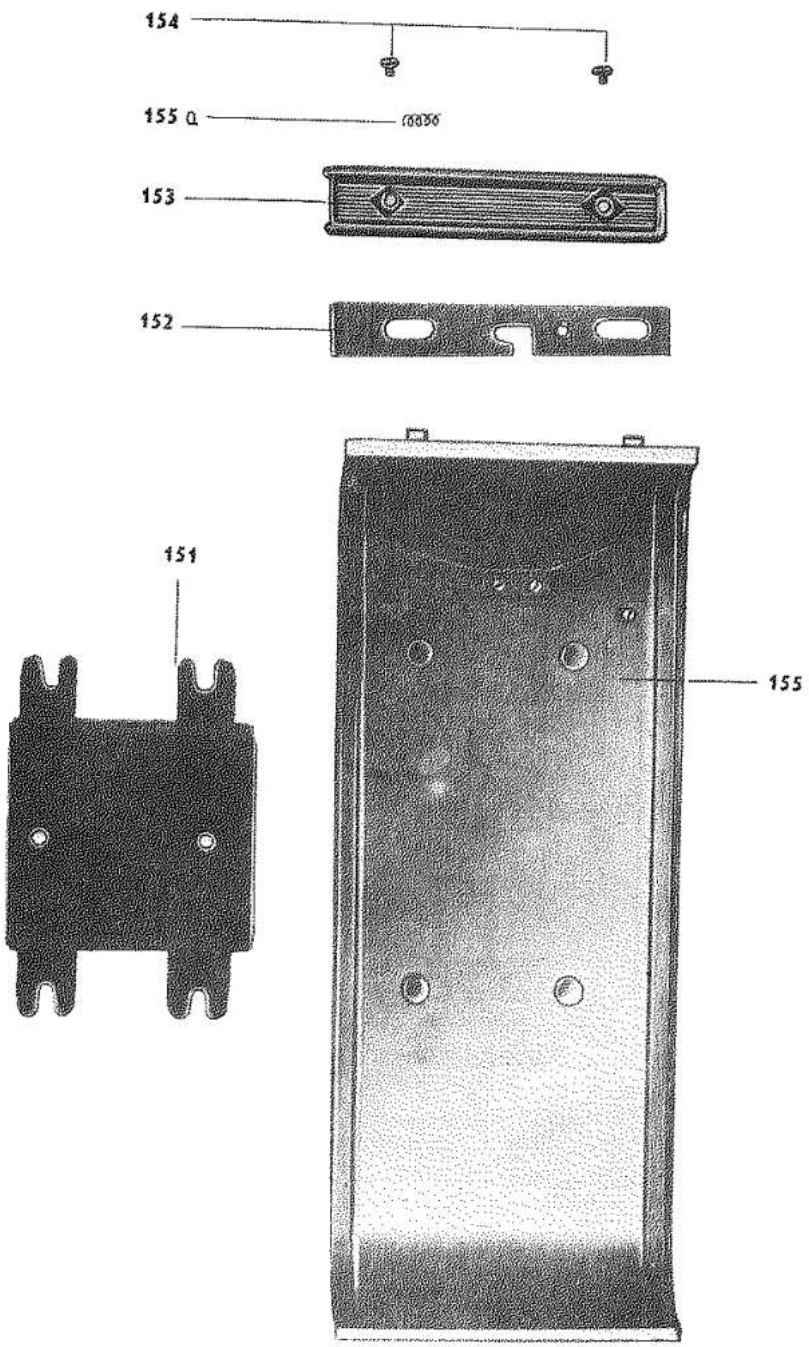
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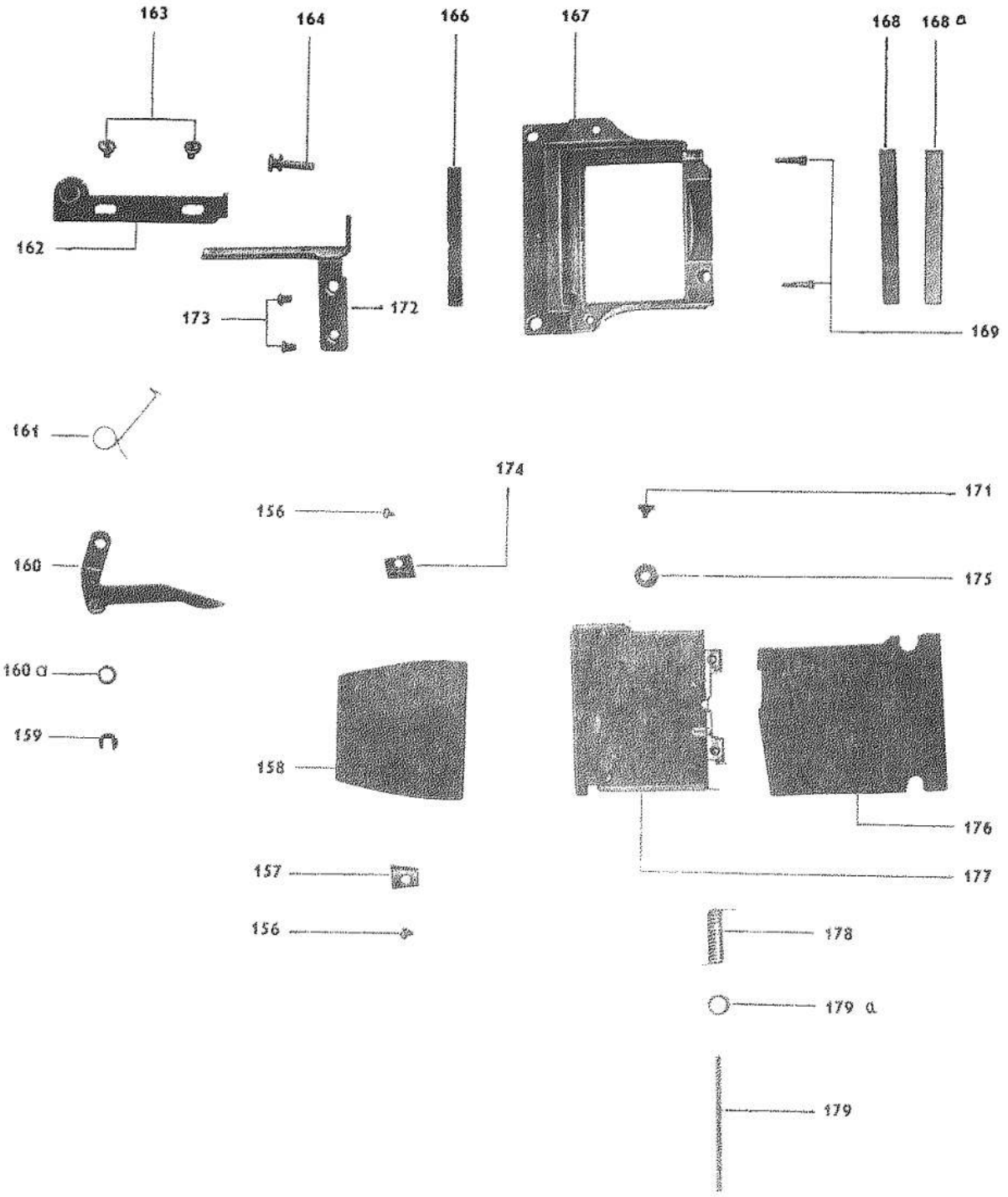
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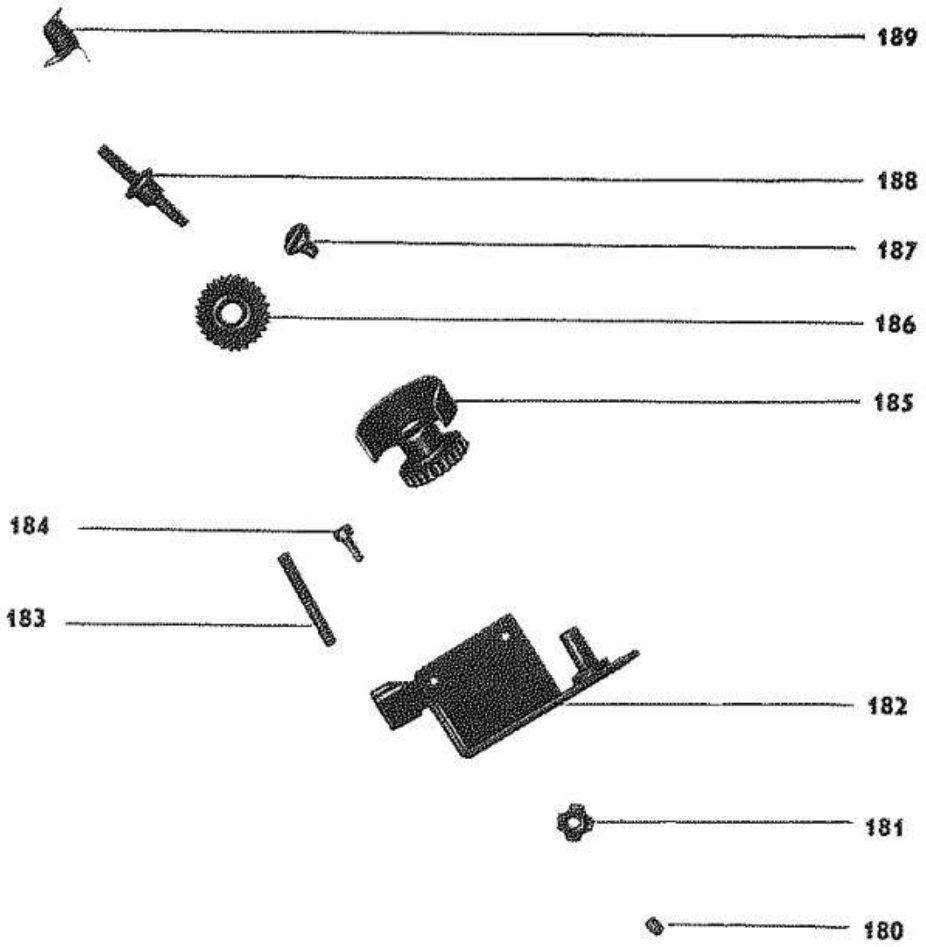
Рис. 12



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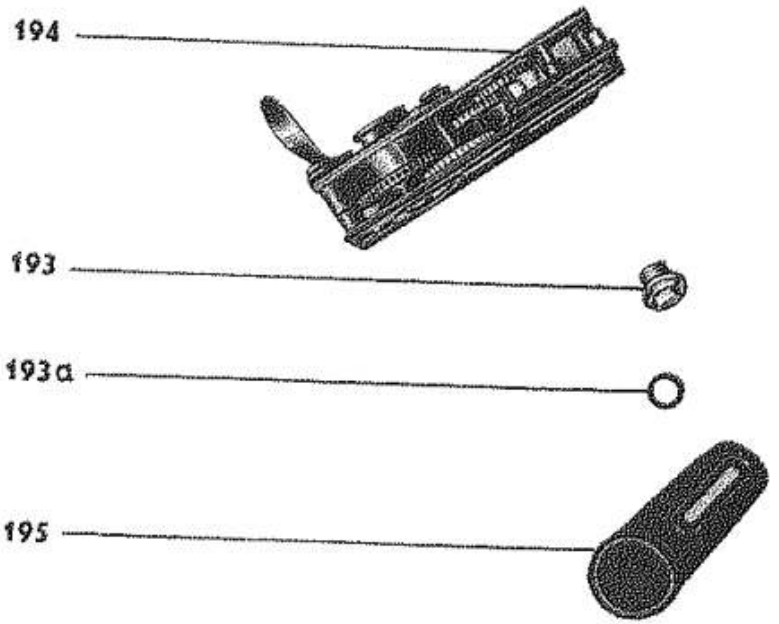

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